Amendment to the Claims:

This listing of claims replaces all prior versions, and listings, of claims in the application:

1-7.   (Canceled)

8.   (Currently Amended) A method for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including:

utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size;

utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock; and

utilizing a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is ~~dependent only upon a relationship to~~ directly derived from the first QP value, and ~~wherein the relationship comprises a property that~~ the second QP value for said first macroblock is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock.

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9.   (Currently Amended) A method for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including:

utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size;

utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock; and

utilizing a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from ~~dependent only upon a relationship to~~ the first QP value, and ~~wherein the relationship comprises a property that~~ the second QP value for said first macroblock is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock, and

wherein ~~for said relationship,~~ directly deriving the second QP value ~~is determined~~ from the first QP value includes ~~by~~ applying a bias value to the first QP value.

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10.   (Currently Amended) A method for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including:

utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size;

utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock;

utilizing a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from ~~dependent only upon a relationship to~~ the first QP value, and ~~wherein the relationship comprises a property that~~ the second QP value for said first macroblock is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock;

applying the first and second QP values; and

compressing the color video image, after application of the first and second QP values, to a compressed output image.

11. (Original) The method of claim 10, further including decompressing the compressed output image using the first and second QP values to obtain an uncompressed video image.

12. (Currently Amended) A method comprising:

in a YUV video image compression system, utilizing macroblocks and quantization parameters during compression, a variable quantization step size and a quantization parameter (QP) representing a size of a step, where an increase in QP corresponds to a larger quantization step size;

selecting at least one of reducing chroma noise during compression of a color video image and achieving higher compression during compression of the color video image;

in response to selecting reducing chroma noise,

utilizing a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilizing a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is directly derived from ~~dependent only upon a first relationship to~~ the first QP value, and ~~wherein the first relationship comprises a property that~~ the second QP value is lower than the first QP value so that said at least one of the U and V color channels

has finer quantization resolution than the Y luminance channel for said first macroblock; and

in response to selecting achieving higher compression,

utilizing the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilizing the second QP value for said at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a ~~second~~ relationship to the first QP value, and wherein the ~~second~~ relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock.

13. (Currently Amended) A method comprising:

in a YUV video image compression system, utilizing macroblocks and quantization parameters during compression, a variable quantization step size and a quantization parameter (QP) representing a size of a step, where an increase in QP corresponds to a larger quantization step size;

selecting at least one of reducing chroma noise during compression of a color video image and achieving higher compression during compression of the color video image;

in response to selecting reducing chroma noise,

utilizing a first QP value for a Y luminance channel of a
first macroblock of the color video image, and

utilizing a second QP value for at least one of a U color
channel and a V color channel of said first macroblock of the
color video image, wherein said second QP value is <u>directly</u>
<u>derived from</u> ~~dependent only upon a first relationship to~~ the
first QP value, <u>and</u> ~~wherein the first relationship comprises a~~
~~property that~~ the second QP value is lower than the first QP
value so that said at least one of the U and V color channels
has finer quantization resolution than the Y luminance channel
for said first macroblock; and

in response to selecting achieving higher compression,

utilizing the first QP value for the Y luminance channel of
said first macroblock of the color video image, and

utilizing the second QP value for said at least one of the
U and V color channels of said first macroblock of the color
video image, wherein said second QP value is dependent only upon
a ~~second~~ relationship to the first QP value, wherein the ~~second~~
relationship comprises a property that the second QP value is
higher than the first QP value so that said at least one of the
U and V color channels has coarser quantization resolution than
the Y luminance channel for said first macroblock, and

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wherein for at least one of said <u>direct derivation or relationship</u> <s>relationships</s>, the second QP value is determined by applying a bias value to the first QP value.

14.   (Currently Amended) A method comprising:

in a YUV video image compression system, utilizing macroblocks and quantization parameters during compression, a variable quantization step size and a quantization parameter (QP) representing a size of a step, where an increase in QP corresponds to a larger quantization step size;

selecting at least one of reducing chroma noise during compression of a color video image and achieving higher compression during compression of the color video image;

in response to selecting reducing chroma noise,

utilizing a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilizing a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is <u>directly derived from</u> <s>dependent only upon a first relationship to</s> the first QP value, and <s>wherein the first relationship comprises a property that</s> the second QP value is lower than the first QP value so that said at least one of the U and V color channels

has finer quantization resolution than the Y luminance channel for said first macroblock;

in response to selecting achieving higher compression,

utilizing the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilizing the second QP value for said at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a ~~second~~ relationship to the first QP value, and wherein the ~~second~~ relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock;

applying the first and second QP values; and

compressing the color video image, after application of the first and second QP values, to a compressed output image.

15.   (Original) The method of claim 14, further including decompressing the compressed output image using the first and second QP values to obtain an uncompressed video image.

16-36. (Canceled)

37. (Currently Amended) A computer program, stored on a computer-readable medium, for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size, the computer program comprising instructions for causing a computer to:

utilize a first QP value for a Y luminance channel of the color video image for a first macroblock; and

utilize a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from ~~dependent only upon a relationship to~~ the first QP value, and ~~wherein the relationship comprises a property that~~ the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock.

38. (Currently Amended) A computer program, stored on a computer-readable medium, for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters

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during compression, including utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size, the computer program comprising instructions for causing a computer to:

utilize a first QP value for a Y luminance channel of the color video image for a first macroblock; and

utilize a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from ~~dependent only upon a relationship to~~ the first QP value, and ~~wherein the relationship comprises a property that~~ the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock, and

wherein ~~for said relationship,~~ directly deriving the second QP value ~~is determined~~ from the first QP value includes ~~by~~ applying a bias value to the first QP value.

39.   (Currently Amended) A computer program, stored on a computer-readable medium, for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including utilizing a variable quantization

step size and a quantization parameter (QP) to represent a size
of a step where an increase in the QP corresponds to a larger
quantization step size, the computer program comprising
instructions for causing a computer to:

utilize a first QP value for a Y luminance channel of the
color video image for a first macroblock;

utilize a second QP value for at least one of U and V color
channels of the color video image for said first macroblock,
wherein said second QP value is directly derived from ~~dependent
only upon a relationship to~~ the first QP value, and ~~wherein the
relationship comprises a property that~~ the second QP value is
lower than the first QP value so that said at least one of the U
and V color channels has finer quantization resolution than the
Y luminance channel for said first macroblock;

apply the first and second QP values; and

compress the color video image, after application of the
first and second QP values, to a compressed output image.

40. (Original) The computer program of claim 39, further
including instructions for causing a computer to decompress the
compressed output image using the first and second QP values to
obtain an uncompressed video image.

41.   (Currently Amended) A computer program, stored on a computer-readable medium, including instructions operative to cause a computer to:

in a YUV video image compression system, utilize macroblocks and quantization parameters during compression, a variable quantization step size, and a quantization parameter (QP) to represent a size of a step, where an increase in QP corresponds to a larger quantization step size;

select at least one of reducing chroma noise during compression of a color video image and achieve higher compression during compression of the color video image;

in response to selecting reducing chroma noise,

utilize a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilize a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is ~~dependent only upon a first relationship to~~ directly derived from the first QP value, ~~and~~ ~~wherein the first relationship comprises a property that~~ the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock; and in response to selecting achieving higher compression,

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utilize the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilize the second QP value for at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a ~~second~~ relationship to the first QP value, and wherein the ~~second~~ relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock.

42. (Currently Amended) A computer program, stored on a computer-readable medium, including instructions operative to cause a computer to:

in a YUV video image compression system, utilize macroblocks and quantization parameters during compression, a variable quantization step size, and a quantization parameter (QP) to represent a size of a step, where an increase in QP corresponds to a larger quantization step size;

select at least one of reducing chroma noise during compression of a color video image and achieve higher compression during compression of the color video image;

in response to selecting reducing chroma noise,

utilize a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilize a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is ~~dependent only upon a first relationship to~~ directly derived from the first QP value, and ~~wherein the first relationship comprises a property that~~ the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock; and in response to selecting achieving higher compression,

utilize the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilize the second QP value for at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a ~~second~~ relationship to the first QP value, wherein the ~~second~~ relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock, and

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wherein for at least one of said <u>direct derivation or</u> <u>relationship</u> ~~relationships~~, the second QP value is determined by applying a bias value to the first QP value.

43. (Currently Amended) A computer program, stored on a computer-readable medium, including instructions operative to cause a computer to:

in a YUV video image compression system, utilize macroblocks and quantization parameters during compression, a variable quantization step size, and a quantization parameter (QP) to represent a size of a step, where an increase in QP corresponds to a larger quantization step size;

select at least one of reducing chroma noise during compression of a color video image and achieve higher compression during compression of the color video image; in response to selecting reducing chroma noise,

utilize a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilize a second QP value for at least one of. a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is ~~dependent~~ ~~only upon a first relationship to~~ <u>directly derived from</u> the first QP value, and ~~wherein the first relationship comprises a~~ ~~property that~~ the second QP value is lower than the first QP

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value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock;

in response to selecting achieving higher compression,

utilize the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilize the second QP value for at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a ~~second~~ relationship to the first QP value, and wherein the ~~second~~ relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock;

apply the first and second QP values; and

compress the color video image, after application of the first and second QP values, to a compressed output image.

44. (Original) The computer program of claim 43, further including instructions for causing a computer to decompress the compressed output image using the first and second QP values to obtain an uncompressed video image.

45-65.   (Canceled)

66.   (Currently Amended) A system for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in QP corresponds to a larger quantization step size, including:

means for utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock;

means for utilizing a second QP value for at least one of the U and V color channels of the color video image for said first macroblock, wherein said second QP value is ~~dependent only upon a relationship to~~ directly derived from the first QP value, and ~~wherein the relationship comprises a property that~~ the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock; and

means for applying the first and second QP values during compression of the color video image.

67. (Currently Amended) A system for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in QP corresponds to a larger quantization step size, including:

means for utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock;

means for utilizing a second QP value for at least one of the U and V color channels of the color video image for said first macroblock, wherein said second QP value is ~~dependent only upon a relationship to~~ directly derived from the first QP value, and ~~wherein the relationship comprises a property that~~ the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock, and

wherein for said <u>direct derivation or </u>relationship, the second QP value is determined by applying a bias value to the first QP value; and

means for applying the first and second QP values during compression of the color video image.

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68. (Currently Amended) A system for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in QP corresponds to a larger quantization step size, including:

means for utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock;

means for utilizing a second QP value for at least one of the U and V color channels of the color video image for said first macroblock, wherein said second QP value is ~~dependent only upon a relationship to~~ directly derived from the first QP value, and ~~wherein the relationship comprises a property that~~ the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock;

means for applying the first and second QP values during compression of the color video image; and

means for compressing the color video image, after application of the first and second QP values, to a compressed output image.

69. (Original) The system of claim 68, further including means for decompressing the compressed output image using the first and second QP values to obtain an uncompressed video image.

70. (Currently Amended) A YUV video image compression system configured to utilize macroblocks and quantization parameters during compression, a variable quantization step size, and a quantization parameter (QP) to represent a size of a step where an increase in QP corresponds to a larger quantization step size, the system including:

means for selecting at least one of reducing chroma noise during compression of a color video image and achieving higher compression during compression of the color video image;

means for, in response to selecting reducing chroma noise,

utilizing a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilizing a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is ~~dependent only upon a first relationship to~~ directly derived from the first QP value, and ~~wherein the first relationship comprises a property that~~ the second QP value is lower than the first QP value so that said at least one of the U and V color channels

has finer quantization resolution than the Y luminance channel for said first macroblock; and

means for, in response to selecting achieving higher compression,

utilizing the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilizing the second QP value for at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a ~~second~~ relationship to the first QP value, and wherein the ~~second~~ relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock; and

means for applying the first and second QP values during compression of the color video image.

71. (Currently Amended) A YUV video image compression system configured to utilize macroblocks and quantization parameters during compression, a variable quantization step size, and a quantization parameter (QP) to represent a size of a step where an increase in QP corresponds to a larger quantization step size, the system including:

means for selecting at least one of reducing chroma noise during compression of a color video image and achieving higher compression during compression of the color video image;

means for, in response to selecting reducing chroma noise,

utilizing a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilizing a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is ~~dependent only upon a first relationship to~~ directly derived from the first QP value, and ~~wherein the first relationship comprises a property that~~ the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock; and

means for, in response to selecting achieving higher compression,

utilizing the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilizing the second QP value for at least one of the U and V color channels of said first macroblock of the color video image, wherein for said first macroblock, wherein said second QP value is dependent only upon a ~~second~~ relationship to the first QP value, wherein the ~~second~~ relationship comprises a property

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that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock, and

wherein for at least one of said <u>direct derivation or relationship</u> ~~relationships~~, the second QP value is determined by applying a bias value to the first QP value; and

means for applying the first and second QP values during compression of the color video image.

72. (Currently Amended) A YUV video image compression system configured to utilize macroblocks and quantization parameters during compression, a variable quantization step size, and a quantization parameter (QP) to represent a size of a step where an increase in QP corresponds to a larger quantization step size, the system including:

means for selecting at least one of reducing chroma noise during compression of a color video image and achieving higher compression during compression of the color video image;

means for, in response to selecting reducing chroma noise, utilizing a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilizing a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the

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color video image, wherein said second QP value is ~~dependent~~ ~~only upon a first relationship to~~ directly derived from the first QP value, and ~~wherein the first relationship comprises a~~ ~~property that~~ the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock;

means for, in response to selecting achieving higher

utilizing the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilizing the second QP value for at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a ~~second~~ relationship to the first QP value, and wherein the ~~second~~ relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock;

means for applying the first and second QP values during compression of the color video image; and

means for compressing the color video image, after application of the first and second QP values, to a compressed output image.

73.   (Original) The system of claim 72, further including means for decompressing the compressed output image using the first and second QP values to obtain an uncompressed video.

74-87.   (Canceled).

88.   (Currently Amended) The method of claim 8 or 12, wherein ~~the~~ directly deriving the second QP value from the first QP value includes accessing ~~relationship is defined in~~ a lookup table comprising a plurality of QP values.

89.   (Currently Amended) The computer program of claim 37 or 41, wherein directly deriving the second QP value from the first QP value includes accessing ~~the relationship is defined in~~ a lookup table comprising a plurality of QP values.

90.   (Currently Amended) The system of claim 66 or 70, wherein directly deriving the second QP value from the first QP value includes accessing ~~the relationship is defined in~~ a lookup table comprising a plurality of QP values.

91. (New) The method of claim 8, wherein the direct derivation is independent of pixel values for any of the color channels or the luminance channel.

92. (New) The method of claim 12, wherein the direct derivation is independent of pixel values for any of the color channels or the luminance channel.

93. (New) The computer program of claim 37, wherein the direct derivation is independent of pixel values for any of the color channels or the luminance channel.

94. (New) The computer program of claim 41, wherein the direct derivation is independent of pixel values for any of the color channels or the luminance channel.

95. (New) The system of claim 66, wherein the direct derivation is independent of pixel values for any of the color channels or the luminance channel.

96. (New) The system of claim 70, wherein the direct derivation is independent of pixel values for any of the color channels or the luminance channel.

97. (New) A method for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including:

utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size;

utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock; and

utilizing a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is derived independently of pixel values for any of the color channels or the luminance channel, and the second QP value for said first macroblock is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock.

98. (New) The method of claim 97, wherein deriving the second QP value independently of pixel values for any of the color channels or the luminance channel includes applying a bias value to the first QP value.

99. (New) The method of claim 98, wherein applying the bias value to the first QP value comprises adding the bias value to the first QP value or subtracting the bias value from the first QP value.

100. (New) The method of claim 97, wherein deriving the second QP value independently of pixel values for any of the color channels or the luminance channel includes accessing a lookup table comprising a plurality of QP values.